Technical Review Comments

Pierson's Creek OU-2 Remedial Investigation – Revision 1

CDM Federal Programs (CDM Smith) has reviewed the Remedial Investigation (RI) Report, Revision 1 prepared by Geosyntec consultants (Geosyntec) dated March 24, 2019 (actual date April 24, 2019) for the Pierson's Creek Superfund Site, Operable Unit 2 (OU-2), located in Newark, New Jersey. Comments are provided as follows:

1) General comments on the entire report
2) General and specific comments on the various report sections, including the text, tables, figures, and appendices included in the report
3) Comments on Appendix D – Baseline Human Health Risk Assessment (BHHRA) will be submitted separately

A rebuttal to the response to comments dated March 24, 2019 (error) is not provided because a large majority of the report was completely revised. Therefore, a full review of the revised report was completed. Where previous comments and responses apply, the comment number is referenced.

CDM Smith's comments are listed below.

General Comments on RI Report Revision 1

G1. For future submittals of this and other documents do not include the Response to Comments as part of the document. The Response to Comments should be submitted as a separate letter/document.

G2. Discussion of contaminants of concern (COCs) throughout the RI Report – The list of COCs are developed by media based on the risk scenarios assessed within the BHHRA. The way the COCs are described and assessed within the RI Report is problematic because the evaluation ignores contaminants in a site medium even if the contaminants are COCs in another site medium, and altogether ignores whether contaminants are present above potential media-specific standards, criteria, and screening levels. This results in a lack of foundational information of the nature and extent of contamination in all site media in order to support a well-thought-out conceptual site model (CSM). Examples and the issues they raise are provided below.

a. The report attributes shallow groundwater contamination to metals in shallow soils, but there is no presentation of those metals' concentrations in shallow soils because those metals are not considered COCs in shallow soils. Without discussion and presentation of metals concentrations in soil, attribution is not supported.

b. Because lead and mercury are not COCs in deep groundwater, lead and mercury concentrations in deep groundwater are not discussed. However, it must be discussed whether lead and mercury, major site contaminants, may be impacting deep groundwater. Revise the report to include this discussion.

c. Because benzene and arsenic are not COCs in the concrete ditch and culvert, benzene and arsenic concentrations in the concrete ditch and culvert sediments are not discussed. However, benzene and arsenic are present at elevated concentrations in the concrete ditch and culvert sediments. Benzene and arsenic are COCs in shallow groundwater, and the concrete ditch and culvert sediments are a potential continuing source of benzene and arsenic to the shallow groundwater. To support this evaluation, revise the text to include discussion of the benzene and arsenic concentrations in the concrete ditch and culvert must be presented.

d. Discussion of COCs in deep groundwater indicates that the contaminants are from an upgradient source, but there is no discussion of the presence of those COCs in shallow groundwater. Thus, there is no evaluation of whether contaminants in shallow groundwater may be migrating to deep groundwater. For numerous deep groundwater COCs, the discussion concludes that because a COC in deep groundwater is not a COC in shallow groundwater, deep groundwater is not impacted by shallow groundwater. This is inaccurate, as the determination of COCs is based on risk, not on the presence of a contaminant. Revise the text to include discussion of the range of contaminant concentrations in shallow groundwater when discussing the potential sources to deep groundwater COCs.

e. Soils below 10 feet below ground surface (bgs) are not discussed, as contaminants in these soils are not designated COCs. Revise the report to include discussion of the extent of COCs in soils below 10 feet to provide delineation of the vertical extent of contamination in soils.

Revise the RI Report to include a discussion of the nature and extent of contamination for all COCs, regardless of the media in which they are shown to cause risk, to fully support an understanding of contaminant distribution, fate and transport of contaminants, and development of the CSM.

G3. Attribution of contamination to regional degradation of groundwater, presence of historic fill, naturally occurring metals in soils, and upgradient sites –

a. When attributing elevated concentrations of contaminants in groundwater to upgradient contamination or regional degradation of groundwater provide an assessment of groundwater flow and the groundwater concentrations on the upgradient edge of the site compared to downgradient to support attribution. If using other secondary evidence (such as Classification Exception Areas [CEAs] being in place due to those contaminants) without providing the upgradient concentrations that led to those CEAs, the reader cannot assess whether on-site contamination is from upgradient sources or related to sources within OU-2 (e.g.,

whether groundwater has been impacted by OU-2 soils or the concrete ditch and culvert sediments). Revise the text to include discussion of this assessment.

b. When attributing groundwater contamination to the presence of historic fill or naturally occurring inorganics within the soils, include information regarding the concentrations of the compounds within the soils (regardless of whether they are COCs in soil). Concentrations in soils should be compared to those expected to be within historic fill or naturally occurring in soils in the area to support this point.

c. The report cites a New Jersey Department of Environmental Protection (NJDEP) Technical Guidance on Historic Fill from 2008. However, that version of the guidance document has been replaced with a more recent version (2013) that does not contain ranges of metals commonly associated with historic fill. Explain why the 2008 version of the NJDEP guidance remains valid or provide other information or data that supports the expected ranges of contaminants that are present in historical fill at the site.

d. The report frequently attributes contamination to upgradient sites; however, the information provided in the report is insufficient to support that conclusion. Revise the report to include additional information to support the conclusion that OU-2 has been impacted by contaminants related to upgradient sites.

G4. Use of screening criteria – Concentrations of contaminants are not compared to screening criteria, as was recommended in General Comment No. 6. in EPA's comments on the Draft RI Report. While the figures now indicate that the concentration bins are related to relevant standards and criteria such as NJDEP Non-residential Direct Contact Soil Remediation Standards (SRS) and EPA Regional Screening Levels (RSLs) for soil, they do not indicate which concentration bin corresponds to which standard or criteria. Without this comparison, the distribution of COCs exceeding the standard or criteria unclear. In addition, Section 5 has not been updated to provide any context to the data presented in the Figures. Lead is discussed in relation to 10,000 milligram per kilogram (mg/kg), mercury is discussed in relation to 1,000 mg/kg, total polychlorinated biphenyls (PCBs) are discussed in relation to 100 mg/kg, and trichloroethene (TCE) is discussed in relation to 100 mg/kg. It is unclear what the basis for these numbers are. It is fine to keep this discussion to express the magnitude of the concentrations seen, but there should also be discussion of these contaminants in relation to applicable standards. For example, while tetrachloroethene (PCE) and cobalt are discussed in relation to their NJDEP Non-Residential Soil Remediation Standard, it would be helpful for the reader if the text identified that the value is the NJDEP Non-Residential Soil Remediation Standard to give some context to the discussion.

a. Revise the text to include discussion comparing concentrations to relevant standards and criteria.

b. Revise the data tables to include use of relevant standards and criteria for all media to compare contaminant concentrations against.

c. Revise the figures to identify which concentration bin corresponds to which relevant standard or criteria value.

G5. Fate and transport – The fate and transport discussion is generally lacking a thorough analysis of the properties of all COCs, how the COCs are generally expected to behave in the environment based on their properties, and a discussion of potential migration pathways at the site. Additional general and specific comments are included for Section 6.

G6. Conceptual site model – The CSM should integrate the different types of information presented in the RI Report including site physical characteristics and setting, and contaminant sources, distribution, and fate and transport associated with the site. New information should not be presented in the CSM. The CSM is not adequately supported by discussion in Sections 4, 5, or 6. The CSM introduces new information to support conclusions made within the CSM that should have been provided prior to Section 7, such as the concentration ranges for historic fill and the detailed information regarding the installation of MW-02D creating a preferential pathway for contamination to the deep groundwater. Additional general and specific comments are included for Section 7.

G7. Throughout the report, replace the naming of the concrete ditch and culvert material from "material" to "sediment," since it is indicated that the solid material in the ditch and culvert was deposited by fluid flow while the ditch and culvert were part of an active drainage system.

G8. The General Comment No. 5 on the Draft RI Report was not fully addressed. The response noted, "additional citations have been added into the report. Appendix A has been added to the RI and contains referenced documents that may not be publicly available." It appears references were added as noted; however, the only references included in Section 10 (References) that were provided in Appendix A were Findley 2002 and Prentiss Drug & Chemical Co n.d. There are two other references provided in Appendix A that do not match any of the references listed in Section 10 (i.e., the Steptoe letter re: Use of "Area of Contamination" Approach to Address Rolloff Containers containing Excavated Dutch Material at Troy's Newark Manufacturing Plant and the 1995 ELM letter). Revise the document so all references are correct, and list all references in Section 10.

G9. The RI Report and the BHHRA offer conflicting definitions of surface soils and shallow soils. For example, Section 3.2 of the RI Report indicates that shallow soils are from 0 to 10 feet bgs. Table D-9 in the BHHRA indicates that shallow soils are from 0 to 10 feet bgs and surface soils are from 0 to 1 foot bgs. However, the last sentence in the first paragraph of Section 5.2 on the RI indicates that shallow soils are from 1 to 10 feet bgs. Revise the documents to consistently define surface and shallow soils throughout the entire text of the RI Report and the BHHRA.

G10. There are inconsistencies between data presented in the tables, figures, and the text. Specific examples of inconsistencies are described in Specific Comments on Figures and Tables; however, that list is not comprehensive. Perform a thorough quality control check between the data presented in the tables, figures, and text.

G11. Perform a thorough editorial review and correct issues such as technically questionable language, missing words, misplaced information, incorrect callouts for figures, incorrect use of plural or singular terms, run-on and incomplete sentences, grammatical and punctuation errors, and misspellings. These issues make it difficult to review the document's technical content.

Specific Comments on RI Report - Revision 1

Executive Summary

General Comment

1. Revise the executive summary to reflect, and be consistent with, the general and specific comments provided below.

Section 1

2. No additional comments on Section 1.

Section 2

Specific Comments

Specific comments are provided on the current text; however, the text should be revised as indicated in the general comments. Where the text is reorganized, these comments apply to the new location of the text.

3. Section 2.1, first paragraph, third sentence: Revise the sentence to state "The property boundaries, along with the routing of the concrete ditch and culvert that transects the property and formerly drained industrial wastewater and stormwater from the upgradient industrial section of Newark and OU-2, are depicted on Figure 2-2."

4. Section 2.1.1:

   a) First paragraph: Replace the beginning of the first paragraph with the following:

   "A key feature of OU-2 is the concrete ditch and culvert that run north to south through the middle of OU-2 (Figure 2-2). The ditch and culvert were historically part of the Pierson's Creek drainage system and have been modified over time with infrastructure, including concrete and gabion walls, to create an industrial wastewater and stormwater conveyance system that became used under an easement and operated by the City of Newark. This drainage system was part of an approximately 700-acre industrial wastewater and stormwater catchment area that received industrial wastewater and stormwater from OU-2 and the surrounding areas. The concrete ditch was constructed…"

   b) Third paragraph, third sentence: Define what contaminants are considered contaminants of interest (COIs) during this first mention of COIs. Also, describe the difference between the terms "COI" and "COC", which is discussed later in the report.

   c) Fifth paragraph, first sentence: Follow-up to Specific Comment No. 19 on the Draft RI Report. There is indication (see link: https://semspub.epa.gov/work/02/363188.pdf) that the pretreatment system installed in 1965 was a sulfide precipitation treatment

system. Revise the first and second sentences in this paragraph to state "In 1965, a sulfide precipitation pretreatment system was installed in TCNMP and operated to treat mercury wastewater from TCNMP operations prior to discharging wastewater to the concrete ditch and culvert. In 1976, an on-site wastewater treatment plant was installed that discharged to the PVSC (Weston Solutions Inc. 2013a)."

d) Eighth paragraph: Specific Comment No. 12 on the Draft RI Report requested clarification on whether the concrete culvert had been plugged on the northern or southern ends of OU-2. Unless clear evidence notes otherwise and is added to the report, add the following sentence to the end of the eighth paragraph: "It is not known if the concrete culvert extended beyond the limits of OU-2, or if it has been plugged on the northern or southern ends."

5. Section 2.2, second paragraph, last sentence: The sentence, as written, implies that all of the properties listed on Figure 2-5 contributed to the regional groundwater degradation. It also implies that all of the properties are upgradient of the site. The Findley 2002 reference does not state that all of these properties contributed to regional groundwater degradation but rather "constituents detected in the deeper water-bearing unit are related to documented regional groundwater degradation." Unless there are other references to suggest that each of these properties contributed to regional groundwater degradation, the sentence should be revised to state "Figure 2-5 indicates the names and locations of the major historical industrial properties that surround OU-2, some of which may have contributed to the overall regional degradation of deep groundwater quality observed in the area (Findley 2002)."

6. Section 2.2.2, first paragraph: Specific Comment No. 10 on the Draft RI Report requested that this section include a list of the chemicals Troy Chemical Corporation, Inc. produced/utilized at the property after 1980, as a list was not included in this section. Add a sentence to this paragraph providing a general overview of the list of chemicals Troy Chemical Corporation, Inc. produced/utilized at the property after 1980. The following sentence is an example based on information from EPA: Troy Chemical Corporation manufactures paints and coatings, petrochemicals, pesticides and other agricultural chemicals, and other basic inorganic chemicals. This list is per the NAICS Codes for Troy Chemical Corporation: https://enviro.epa.gov/enviro/rcrainfoquery_3.facility_information?pgm_sys_id=NJD002144517.

7. Section 2.4.2, second paragraph, second sentence: Delete this sentence, as it is a repeat of the information in the first sentence.

8. Section 2.4.3, first paragraph, second sentence: Provide a citation for this statement.

9. Section 2.5.2, first paragraph: Remove the last sentence of this paragraph, as the CEA has not yet been granted.

10. Section 2.5.3, third paragraph, last sentence: This sentence was added in response to Specific Comment No. 56 on the Draft RI Report, which requested that the text be revised

to include the remediation goal for the remedial action. While the remedial objective was provided, the remediation goal (i.e., concentration) was not. Revise this sentence to include the remediation criteria that is referenced in this sentence.

11. Section 2.5.4:

    a. Second paragraph, first sentence: The reference to "industrial wastewater" was not removed as requested in Specific Comment No. 57 on the Draft RI Report. If a reference cannot be provided to support the statement that industrial wastewater was being discharged from the FedEx property to the concrete ditch, revise the first sentence to state "A discharge pipe from the adjoining FedEx property (former ASD site) potentially discharged wastewater and stormwater into the concrete ditch and culvert at the northern end of OU-2."

    b. Third paragraph, first sentence: The sealing of the southern end of the concrete ditch does not prevent water from flowing out of the concrete ditch and culvert, as portions of the concrete ditch and culvert are open to shallow groundwater flow. Revise this sentence to state "Before remediation activities started in the concrete ditch and culvert in 2012, the southern end of the concrete ditch was also sealed with concrete to prevent stormwater from flowing downstream."

12. Section 2.5.6:

    a. Second paragraph: Provide results for the waste characterization samples in Appendix A.

    b. Third paragraph: Provide additional detail on these post-excavation samples including what analyses were conducted on the samples and that the samples were collected from the bottom and sidewalls of the excavation. The text only refers to samples that were collected in the area surrounding Building 41.

    c. Third paragraph, second sentence: The results of the post-excavation samples are not presented in the Section 5.3 figures, as Section 5.3 discusses groundwater. Revise this reference.

13. Section 2.6, bulleted list: The list of COCs provided should match the COCs discussed in Section 5. As written, this bulleted list presents PCE as a secondary COC for the concrete ditch and culvert material, when Section 5 lists PCE as a primary COC.

Section 3

Specific Comment

14. Section 3.5: Though requested in Specific Comment No. 100 on the Draft RI Report, the groundwater sampling field forms were not included in Appendix F. Include the groundwater sampling field forms in Appendix F.

Section 4

General Comment

15. Though requested in Specific Comment No. 32 on the Draft RI Report, there is no discussion of the interaction between the shallow groundwater within and outside of the concrete ditch, as previously discussed in the first paragraph of Section 2.4.3. Include and expand upon this discussion within Section 4.

Specific Comments

Specific comments are provided on the current text; however, the text should be revised as indicated in the general comments. Where the text is reorganized, these comments apply to the new location of the text.

16. Section 4.1: As noted in Specific Comment No. 110 below, compile discussion of historical and current stormwater drainage and flooding of OU-2 within this section of the report. Include the likely mechanisms behind the historical and current flooding and relate it to the historical and current ground surface so that it is not presented to the reader haphazardly throughout the discussion in Sections 5, 6, and 7. This will assist in supporting the concept that flooding was an important transport mechanism at the site.

17. Section 4.2:

    a. Second paragraph: Provide evidence of the permeability of the meadow mat layer. Response to Specific Comment No. 106 on the Draft RI Report noted that "Discussions of hydraulic conductivity is based on published information and soil properties." Provide references to published permeability information on the meadow mat. The layer would be expected to have lower permeability than the historic fill above; however, other than some areas where it contains more clayey material, the field observations noted its appearance as peat material consisting of fibrous material, roots, phragmites, etc. This layer would be moderately transmissive and would not act as a significant aquitard as noted in the report.

    b. Last paragraph: The first sentence, as written, implies that the shallow and deep groundwater at OU-2 are not suitable for use as drinking water because they are regionally contaminated and/or contaminated by historic fill. This sentence should be deleted. There is a CEA for shallow groundwater on the property because of metals and volatile organic compounds (VOCs) contamination in groundwater. While the concentrations of metals may be attributable in part to historic fill, the VOCs are not. There is insufficient evidence presented to support the conclusion that the VOCs are from an upgradient source. Add the following sentence after the third sentence in the second paragraph: "Deep groundwater is being reevaluated under the federal Superfund program; this evaluation may result in a different conclusion regarding the need for remedial action." Revise the fourth sentence to state "Shallow groundwater at OU-2 is managed under a CEA issued by NJDEP on February 12, 2004, due to the presence of metals and VOCs in the shallow groundwater on-site." Remove the sixth (last) sentence, as it is speculation and is not relevant to the RI Report. Also, the word "indeterminant" used in this paragraph should be corrected to "indeterminate"

18. Section 4.6, second paragraph, and Figure 4-3: As noted in the second sentence, the contours shown on Figure 4-2 for the 2019 and 2020 maps appear to show shallow groundwater flow potential toward both the east/northeast and west/southwest, with a groundwater flow divide east of Building 56 or near Building 61. Is there any indication of on-site features that may be causing this, besides the unnamed tributary? A similar northeasterly historical flow direction is noted in the TRC 1993 ASD report that is referenced within this RI. This flow potential should be indicated on the 2019 and 2020 flow maps on Figure 4-2 (especially in the August 2019 panel), and unless otherwise explained, elaborated on when groundwater flow direction is being discussed in relation to sources of contamination being upgradient or downgradient throughout the report.

19. Section 4.7, Figure 4-3: As noted in Specific Comment No. 110b on the Draft RI Report, the contours drawn for the deep groundwater unit combine two datasets that should not be contoured together. Contouring potentiometric surface data from wells screened at the top of the glacial till (15 to 25 feet bgs) and significantly deeper (50 to 60 feet bgs) within the glacial till is problematic. The glacial till is described in this report as exhibiting limited vertical and horizontal permeability, and therefore the measured hydraulic heads within these two zones would not be expected to be comparable. As an example, the single well cluster on site (GS-MW-107 and GS-MW-108) shows significant differences in hydraulic head (sometimes as much as 10 feet) indicating that the contours should be drawn from one set of the wells to show representative flow within the unit.

    Contour the wells in the upper portion of the deep aquifer (GS-MW-105, GS-MW-106, and GS-MW-107) independently from the monitoring wells in the deeper portion of the deep aquifer (GS-MW-108, MW-02D, MW-06D) and include the interpreted contours and flow direction on separate groundwater flow maps (or potentially as different colored contours on the deep aquifer groundwater flow maps). There will be fewer wells in each zone and, therefore, less detail in the contours of each aquifer zone. The conclusions drawn on the current maps do not accurately represent groundwater flow because they do not account for differences in well depths and the nature of the glacial till. Revise the second paragraph to describe any variations noted.

Section 5

General Comments

20. Include a section at the beginning of Section 5 presenting the range of contaminant concentrations expected to be present in historic fill; the range of naturally occurring metals concentrations expected to be present in Piedmont Province region soils; and relevant upgradient concentrations that are pertinent to the discussion, including those related to a CEA. Include a summary table presenting the range of detected concentrations in each media for each analyte. On this table, also provide the range of concentrations expected to be seen in historic fill, provide a range of upgradient groundwater concentrations, and provide the number of samples greater than relevant and applicable criteria. Without this, conclusions presented throughout the document are not supported.

Note the following: The NJDEP 2002 reference provided to support an understanding of naturally occurring soils covers only rural areas of New Jersey Highlands, Valley and Ridge, and Coastal Plain physiographic provinces. Remove this reference and add one relevant to the Piedmont Province, such as Characterization of Ambient Levels of Selected Metals and Other Analytes in New Jersey Soils: Year 1, Urban Piedmont Region (NJDEP 1997).

21. Add discussion of concentrations in the concrete ditch and culvert sediments and shallow and deep soils compared to New Jersey Impact to Groundwater criteria to support the fate and transport evaluation, as concentrations greater than these values in sediments/soils could potentially impact groundwater.

Specific Comments

Specific Comments are provided on the current text; however, the text should be revised as indicated in the Section 5 general comments and overall general comments. Where the text is reorganized, these comments apply to the new location of the text.

22. Section 5.1: Provide additional detail on the ASD site information being presented, including the range of upgradient concentrations and the location the sample was collected, and show the locations on a map. For example, ASD site sample SD-9 is discussed in Section 5.1.3.2, but no information is provided about where this sample was collected in relation to the concrete ditch and culvert. Present the concentrations in the concrete ditch and culvert at the upgradient site, ASD, in Sections 5.1.1 and 5.1.2 rather than Section 5.1.3, since these concentrations relate to the concrete ditch and culvert sediment. See Specific Comment No. 40 on the Draft RI Report.

23. Section 5.1, third paragraph: Revise sentence to state: "…when they were part of the active drainage system for the industrial area around and including OU-2."

24. Section 5.1.1.1, first paragraph, last sentence: Average lead concentrations in the concrete ditch and culvert sediments are the same order of magnitude as average lead concentrations in shallow soil. To more accurately compare lead concentrations in the concrete ditch and culvert sediments to those in shallow soils, revise the text to state that lead concentrations are generally three to five times higher than shallow soil.

25. Section 5.1.1.2, fifth sentence: The text states that mercury concentrations greater than 1,000 mg/kg were not found in the ditch material. Figure 5-2 shows several ditch samples (red triangle icon) that indicate a mercury concentrations greater than 1,000 mg/kg, such as PC-2W, PC-1-W, PC-1-E, PC-3W, and PC-2T. Based on this figure, mercury concentrations greater than 1,000 mg/kg are present in samples of the ditch sediment. Revise this sentence to be consistent with the figure.

26. Section 5.1.1.6:

    a. Penultimate sentence: Indicate if PC-5-E is a sample collected from the ditch or from the culvert.

b. Last sentence: From the figures, it appears that TCE concentrations in shallow soils are generally less than 5 mg/kg. Revise this sentence to clarify this.

27. Section 5.1.2.1, last sentence: Cobalt is listed as a secondary COC in Section 5.2 and discussed in Section 5.2.2.4. Revise the text to correct this. Include a comparison to concentrations in shallow soils.

28. Section 5.1.3:

    a. As described in the text, the deepest sample at GS-B-113 was collected from 8 to 10 feet bgs, which corresponds with the invert of the bottom of the culvert. Confirm whether 8 feet bgs or 10 feet bgs corresponds to the culvert's invert elevation. The deepest sample at this location was not collected below the culvert but adjacent to the base of the culvert. Revise the text to note this and indicate how far GS-B-113 was collected from the side of the concrete ditch and culvert.

    b. Only one sample was collected below the concrete ditch and culvert (GS-B-114), and only one sample was collected below the ditch only (PIT-01A). Given that the length of the concrete ditch and culvert on OU-2 is 500 feet, the limited data below the concrete ditch and culvert is a data gap. Revise the text to note this data gap. Additionally, given the integrity of the culvert structure is compromised (Figure 2-4 indicates collapse of a culvert wall), it is possible that contamination has impacted soils below the culvert in other areas. Revise the remainder of the text throughout Section 5.1.3 to remove definitive statements regarding impacts to soils below the concrete ditch and culvert. For example, revise the last sentence in Section 5.1.3.2 to indicate that where soils below the concrete ditch and culvert were sampled, the concentration was several orders of magnitude below the concentrations in sediments in the concrete ditch and culvert. As another example, revise the last sentence in Section 5.1.3.3 to indicate the findings at PIT-01A suggest the elevated concentrations at GS-B-114 may not be present everywhere below the concrete ditch.

29. Section 5.1.3.4, first sentence: The sample depths and corresponding concentrations presented in this sentence do not match the data presented on Figure 5-4. Reconcile the text and the figure.

30. Section 5.2:

    a. PCE concentrations in the concrete ditch and culvert sediments and in groundwater are greater than New Jersey and federal standards and screening levels. PCE in the shallow groundwater was previously treated via in situ bioremediation; however, it is still a site contaminant in other media including the concrete ditch and culvert sediments and deep groundwater. Provide a discussion of PCE in shallow soils.

    b. Include data from GS-B-113 on soil data maps. It was collected adjacent to the concrete ditch and culvert, and not within the concrete ditch and culvert and is therefore representative of shallow soils at the site.

c. The text does not provide discussion of the contaminants that were removed in previously remediated areas around Building 56 and the former Building 41 area. Contamination of soils in these areas may have previously been a source of contamination to the shallow groundwater. Within this section, include discussion of the previous concentrations to provide context for evaluating the current nature and extent of contamination.

d. Revise the text to include discussion of soil data below 10 feet bgs to provide a full discussion of the extent of contamination in OU-2 soils. For example, when mercury is detected in soils from 0 to 10 feet bgs, it is important to discuss whether it is also detected in soils deeper than 10 feet bgs.

e. Revise the text to include discussion of contaminants that may not be COCs according to the BHHRA but may impact groundwater, to support discussion of fate and transport and conclusions drawn in the CSM. This includes any contaminants presented as COCs in shallow and deep groundwater and contaminants present at concentrations in soils greater than the New Jersey Impact to Groundwater screening levels.

31. Section 5.2.1.1, first paragraph, penultimate sentence: Revise this sentence to clarify what is meant by "mixed throughout the depth of shallow soils." If the intent of the sentence is to indicate that lead concentrations in shallow soils vary throughout the top 10 feet, revise the sentence to "… lead concentrations in shallow soils at OU-2 vary throughout the depth of the shallow soils interval."

32. Section 5.2.1.2: As mercury is a primary COC on the site, a more thorough description of the concentrations throughout soils in OU-2 is warranted. Revise the discussion to include the following:

    a. Other areas outside of just the southeast and southwest corners of the site with mercury concentrations greater than relevant standards, criteria, screening levels, including elevated mercury concentrations in soils at the surface and at depth near Building 40 and Building 50 (former Building 41), the area of former Building 35, the area of Building 61 and 65, and the area near the northeast corner of Building 20.

    b. How mercury contamination in these areas relates to historical operations at the site, including mercuric oxide production in Building 40; mercury storage, organomercurial production, and the mercury kiln in Building 61; metallic soap paint dryers in the area of Building 50; and the outdoor mercury reclamation facility near Building 35.

    c. The soils around and below Building 81 was not sampled but may contain elevated concentrations of mercury since the building was previously used for mercuric/mercurous chloride production and raw mercury handling.

    d. Detailed discussion of the shallow soils along the eastern boundary of the property (e.g., BR-10, BR-12, BR-13, BR-14).

33. Section 5.2.1.2, second paragraph, last sentence: Remove "since there are no known historical operations that used PCBs…" because this section presents discussion about mercury in soils.

34. Section 5.2.2.1, second paragraph, last sentence: There are concentrations of PCBs in soils greater than 1 mg/kg (the NJDEP Non-residential Soil Remediation Standard) at various depths throughout OU-2. For example, samples from GS-B-109, GS-B-101, GS-B-103, and other samples contained elevated PCB concentrations at depth up to 8 feet bgs that would not be expected if the only source of PCBs at OU-2 was from flooding (which would cause surface deposition), and PCBs are unlikely to migrate in soils. Revise the text in this section to clarify this point. If it is believed the PCBs migrated vertically through soils, include in Section 6 the chemical properties of PCBs and the soils that would allow this to occur.

35. Section 5.2.2.2: The text indicates that benzene contamination is mostly present in the soils near the southwest corner of Building 56. However, this is simply because there is a higher density of samples in this area. In fact, it appears that elevated benzene concentrations are present throughout the site. Revise the text to provide additional detail on benzene concentrations greater than 5 mg/kg throughout other areas of the site in addition to the area around Building 56, including the following: Building 91, Building 98, southeast of Building 61 and east of Building 65, the central portion of the site (east of Building 1010), the southwest corner parking lot, and east of Buildings 34 and 36. Relate these areas to historical uses of the site that may have potentially caused the contamination.

36. Section 5.2.2.3: Revise the text to provide additional detail on arsenic concentrations greater than 19 mg/kg (the NJDEP Non-residential Soil Remediation Standard) throughout other areas of the site including the area east and southeast of Building 61.

37. Section 5.2.2.3, second paragraph, last sentence: Two of the four soil sampling locations in the southeast corner (B-8 and B-9) have concentrations of arsenic greater than 20 mg/kg as shown on Figure 5-21. Revise this sentence.

38. Section 5.2.2.4, second sentence: Correct the sample name to include hyphens, as presented elsewhere in the report.

39. Section 5.2.2.4, second and third sentences: The cobalt concentrations in GS-B-113 from 2 to 4 feet bgs are within the same range as cobalt concentrations in the concrete ditch and culvert. Revise the text to include additional discussion of this point.

40. Section 5.2.2.5: All data around Building 56 is missing from Figure 5-26 but is provided for benzene on Figure 5-17. Revise Figure 5-26 to include this data. If the "TW-" samples were analyzed for other analytes, provide that sample data on those Section 5 soil figures as well.

41. Section 5.2.2.6: Revise the text to include discussion of the relationship between sample locations B-13 and B-17 and the upgradient site. For example, indicate whether surface

runoff from the upgradient site would travel to B-13 and B-17. Without this information, it is difficult for the reader to understand the relationship.

42. Section 5.3:

    a. Revise this section to include a complete discussion of contaminants that are COCs in either shallow or deep groundwater to provide a comprehensive view of the nature and extent of groundwater contamination at the site. For example, mercury is discussed in shallow groundwater; therefore, it should also be discussed in deep groundwater even if only to say that mercury was not detected in deep groundwater. This will support the conclusion made later in the report that mercury contamination in the shallow groundwater is not impacting the deep groundwater.

    b. Throughout this section, concentrations of several metals (arsenic, cobalt, iron, thallium, barium, cadmium, and vanadium) present in groundwater are attributed to naturally occurring metals in New Jersey or historic fill. However, without some sense of naturally occurring levels in this area of New Jersey, the statements in the RI have little meaning. See Section 5 General Comment 20.

    c. Concentrations of iron and manganese present in groundwater are attributed to the upgradient ASD site. However, without presenting a range of concentrations in the groundwater at the ASD site, the statements in the RI have little meaning. See Section 5 General Comment 20.

43. Section 5.3, first paragraph: This paragraph presents information outside the scope of the nature and extent of contamination in the shallow and deep groundwater aquifers. This information should be presented in the CSM. Revise this paragraph to provide the approach to how the nature and extent of contamination is presented in this section (e.g., groundwater concentrations are discussed in the context of concentrations found in shallow and deep soils since contamination in both aquifers may have migrated from historic fill and natural soils present at the site).

44. Section 5.3.1.1, Arsenic:

    a. Indicate whether concentrations are most elevated in the upgradient or downgradient portion of the site. Additionally, revise the text to include additional detail of the groundwater concentrations in relation to areas of elevated arsenic in shallow soils.

    b. Fourth sentence: This sentence notes that concentrations in MW-06, MW-09, and MW-10 are decreasing. However, Figure 5-33 indicates that arsenic concentrations in these wells increased over the past two sampling events.

    c. Fifth sentence: The incorrect figure is referenced here. Revise the text to reference the correct figure.

45. Section 5.3.1.1, Cobalt: Include the following sentence as the fourth sentence in this paragraph: “All cobalt concentrations in the shallow groundwater are below the New Jersey Ground Water Quality Criterion for cobalt of 100 microgram per liter (µg/L) except

for samples collected from two locations: MW-16 and MW-17." Revise the text to indicate that both MW-16 and MW-17 are collected near the downstream end of the concrete ditch and culvert.

46. Section 5.3.1.1, Iron: Revise this paragraph to include discussion comparing consistently elevated iron concentrations throughout all shallow groundwater of the site to iron concentrations in shallow soils. Add discussion of iron concentrations in soils to Section 5.2.

47. Section 5.3.1.1, Manganese: Revise this paragraph to include discussion comparing consistently elevated manganese concentrations throughout all shallow groundwater of the site to manganese concentrations in shallow soils. Add discussion of manganese concentrations in soils to Section 5.2.

48. Section 5.3.1.1., Thallium: Revise this paragraph to indicate that thallium concentrations in shallow groundwater are below the New Jersey Ground Water Quality Criterion for thallium of 2 µg/L except for one sample collected at GS-MW-103.

49. Section 5.3.1.1, Benzene: Revise the text to discuss potential sources of elevated (greater than 100 µg/L) benzene at MW-04, MW-13, and MW-11. These areas of benzene contamination do not appear to be associated with a source at Building 56. In this discussion, evaluate whether there is a relationship between the elevated concentrations of benzene observed in shallow groundwater and those observed in shallow soils and the concrete ditch and culvert.

50. Section 5.3.1.1, Chloroform: Clarify in this paragraph that monitoring wells with detections of chloroform in the past were not resampled in the recent sampling event.

51. Section 5.3.1.2, Mercury: Revise the text to include additional detail regarding potential sources of mercury in other areas of elevated mercury concentrations in groundwater (concentrations greater than the New Jersey Ground Water Quality Criterion for mercury), including mercury in MW-02, MW-03, MW-09, and MW-04. In this discussion, evaluate whether there is a relationship between the elevated concentrations of mercury observed in shallow groundwater and those observed in shallow soils and the concrete ditch and culvert. At MW-03, in particular, indicate whether there is a source of mercury in soils that could cause rising mercury concentrations.

52. Section 5.3.2:

    a. There is discussion in this section relating chlorinated volatile organic compounds (CVOC) concentrations to the presence of non-aqueous phase liquid (NAPL) at MW-02D. However, the information about the well installation supporting this determination is not presented until Section 7. Include the necessary information in this section to provide context to the remainder of the discussion of deep groundwater.

b. Remove any statement indicating that the contaminant being discussed is naturally occurring, unless supported by a range of naturally occurring concentrations and a citation. See Section 5 General Comment 20.

c. Remove any statements hypothesizing that anaerobic conditions are responsible for metals in groundwater at the site. This evaluation should be included in Sections 6 and 7, following a presentation of geochemical conditions in groundwater and evaluation of whether groundwater conditions are anaerobic and reducing.

53. Section 5.3.2:

a. First paragraph, second sentence: Remove the portion of the sentence following the comma beginning with "indicating." The conditional NFA is not relevant to discussion of the nature and extent of deep groundwater contamination at the site.

b. First paragraph, penultimate sentence: Remove this sentence. These types of conclusions should be evaluated in the CSM. Additionally, it is inconsistent to conclude that that regional contamination is impacting the deep groundwater below OU-2, when the text is also indicating that the lack of groundwater flow in the deep groundwater is the reason why OU-2 contaminants in the deep groundwater are not expected to migrate off-site.

c. First paragraph, last sentence: Revise the text to include a range of concentrations associated with "regional degradation" or "naturally occurring compounds" to support this statement.

54. Section 5.3.2.1, 1,1-Dichloroethane, last sentence; 1,1-Dichloroethene, penultimate sentence; cis-1,2-Dichloroethene, fourth and fifth sentences; Vinyl chloride, fourth and fifth sentences (full sentences): This type of conclusion should be evaluated in the CSM based on supporting information presented in Section 6 (solubility, mobility). Remove these sentences. Additionally, see Section 5 General Comment 20.

55. Section 5.3.2.1, 1,1-Dichloroethane, fourth sentence: Figure 5-64 shows that conditions in MW-02D are not fluctuating; they are rising. Revise this sentence to state: "The 1,1-DCA conditions at MW-02D have increased from 46 µg/L to 440 µg/L over three sampling events conducted in May 2000, August 2003, and March 2019. This increase of concentrations is typical in the presence of NAPL, which is likely present at MW-02D."

56. Section 5.3.2.1, 1,1-Dichloroethene, fourth sentence: Figure 5-66 shows that conditions in MW-02D are not fluctuating; they are rising. Revise this sentence to state: "The 1,1-DCE conditions at MW-02D have increased from 120 µg/L to 540 µg/L over three sampling events conducted in May 2000, August 2003, and March 2019. This increase of concentrations is typical in the presence of NAPL which is likely present at MW-02D."

57. Section 5.3.2.1, 1,1-Dichloroethene, last sentence: Revise this sentence to state the following: "Aside from the elevated concentration of 1,1-DCE observed in MW-02D, the highest 1,1-DCE concentration is at MW-06D."

58. Section 5.3.1: Lead, PCBs, PCE, and TCE are present in the concrete ditch and culvert sediments and in shallow soils at concentrations greater than New Jersey Impact to Groundwater Criteria. Provide discussion of these contaminants in shallow groundwater.

59. Section 5.4.2: Summary of the risk assessment results should be presented in Section 8. Remove the last sentence.

Section 6

General Comments

60. The purpose of a chemical fate and transport section is to examine the chemical and physical processes of the contaminant chemistry to properly develop the CSM. However, as written, this section does not provide the details needed. Reorganize Section 6 and provide additional detail to achieve the objectives of the section as follows:

    a. 6.1 Site-Specific Characteristics Affecting Chemical Fate and Transport: Present the site-specific characteristics in sediment, soil, and groundwater that would influence contaminant fate and transport. This list is currently included as the first bullet list under Section 6.2.1, but there is no detail provided.

    b. 6.2 Chemical Properties Affecting Chemical Fate and Transport: Discuss the chemical properties of each COC and how those chemicals are expected to generally move in the environment based on chemical properties and in light of the site-specific information provided in Section 6.1. For example, if the geochemistry of the groundwater aquifer indicates reducing conditions, discuss how each contaminant would be affected by reducing conditions. For metals, include discussion of likely complexation that form in the environment and how those are expected to move. Present information that is pertinent to developing the CSM later on in the report, such as the solubility of some contaminants in the presence of high concentrations of solvents or in the presence of elemental mercury. Discussion can be combined for like-COCs; however, provide discussion and support for combining COCs.

    c. 6.3 Routes of Migration: Present the transport pathways for each contaminant through the various media at the site. This discussion should be by contaminant rather than by media in order for the reader to follow the contamination along the transport pathway.

    Additional comments are provided on specific sections below.

Specific Comments

Specific comments are provided on the current text; however, the text should be revised as indicated in the Section 6 general comments and overall general comments. Where the text is reorganized, these comments apply to the new location of the text.

61. Section 6:

    a. First paragraph, third sentence: This sentence as written is not clear. Revise this sentence to remove the second half of the sentence beginning at "because of these properties…"

    b. First paragraph, fifth sentence: The tendency for chemicals to sorb to soils is characterized by the organic carbon-water partitioning coefficient (K_{oc}). The octanol-water partitioning coefficient (K_{ow}) characterizes a chemical's propensity to bioaccumulate as octanol is used as a surrogate for lipids. Revise this sentence to "… characterized for chemicals by their organic carbon-water partitioning coefficient, K_{oc}."

    c. First paragraph: Remove the last two sentences of this paragraph as they are unnecessary in the RI Report.

62. Section 6.1.1:

    a. First paragraph, first sentence: Solid materials do not contain COCs. COCs are sorbed to solids. Revise this sentence to indicate such.

    b. First paragraph, second sentence: Revise the text to provide a citation for the parenthetical information.

    c. First paragraph, last sentence: Revise this sentence to state the following: "The concrete ditch is now covered with temporary coverings and plugged at both ends, limiting direct transport of contaminants downstream via movement of contaminated sediments."

    d. Second paragraph, third sentence. Revise this sentence to state the following: "The sides of the concrete ditch are constructed of concrete and gabion walls and the concrete culvert has concrete walls with an area of collapsed culvert wall. As such, these walls limit migration of the sediments within the concrete ditch and culvert into surrounding shallow soils."

    e. Second paragraph, penultimate sentence: Revise this statement to note that COCs in the concrete ditch and culvert can also travel via colloids.

63. Section 6.1.2:

    a. First paragraph, first sentence: Revise this sentence to indicate how shallow soils were contaminated from historical operations (e.g., via direct discharges, spills, filling of soils).

    b. First paragraph, last sentence: Revise "from one location to another" to "throughout the site."

64. Section 6.1.3:

    a. First sentence: Revise the part of the sentence beginning with "can migrate…" to: "can migrate in groundwater via advection. Groundwater flows to the southwest with an average linear velocity of 1.8 ft/day."

    b. First sentence: Indicate which COCs would be more likely to transport in the groundwater via colloids.

    c. Second sentence: Revise the sentence to indicate that retardation is caused by contaminants sorbing to soils in the saturated zone.

    d. Last sentence: Revise the sentence to indicate that volatile compounds at the water table are subject to volatilization, thereby migrating through unsaturated soils as soil vapors and potentially impacting indoor air.

65. Section 6.2, first paragraph: Remove this paragraph as it primarily discusses information that should be reserved for Section 7 and is not relevant to the generally expected contaminant fate in the environment.

66. Section 6.2.1:

    a. First bullet list: Revise the list to also include organic carbon content of the concrete ditch and culvert sediment. Provide site-specific information for each item listed in order to inform the discussion of contaminant fate and transport at the site. The information should be provided for each media (e.g., organic carbon content of the soils above and below the meadow mat and of the meadow mat).

    b. Third paragraph, first sentence on page 58: Information for all COCs should be provided in Table 6.1.

67. Section 6.2.1.1:

    a. The discussion is inconsistent with the list of COCs discussed in Section 5. Discuss the chemical properties and likely fate of all inorganic COCs.

    b. Remove discussion of any sources. It is not relevant when presenting the general chemical properties of COCs and their expected fate in the environment.

    c. Revise text to include discussion of the expected behavior of metals in the presence of high concentrations of solvents and in the presence of elemental mercury.

68. Section 6.2.1.1, second paragraph:

    a. Second sentence: This sentence is not clear. Revise this sentence to indicate whether these ambient pH conditions and oxidizing geochemical conditions are referring to conditions at the site. Reconcile this with the fifth sentence that indicates reducing conditions are present in groundwater at the site.

b. Fifth sentence: Revise the text to indicate additional metals that would be expected to desorb from soils during reducing conditions. Additionally, revise the text to include discussion supporting the conclusion that reducing conditions are present in groundwater at the site.

c. Seventh sentence: Remove the second half of the sentence beginning at "which can cause…" because it doesn't follow from the first half of the sentence and is not relevant to this discussion.

d. Penultimate sentence: It does not follow that because a chemical is a COC that it is present in a medium since the determination of COCs is based on risk. Revise this sentence to state the following: "Arsenic is present in shallow soils, shallow groundwater, and deep groundwater, indicating that arsenic at the site exists sorbed to soils and in groundwater. "

69. Section 6.2.1.1, third paragraph:

a. Remove the first sentence of this paragraph as this section should only discuss the physical, chemical, and microbial processes affecting persistence as indicated in the title of this subsection.

b. Elemental mercury is present at the site. Revise text to include discussion of the properties of elemental mercury and how those properties may influence expected environmental fate and transport.

c. Second sentence: Mercury is present in soils and the concrete ditch and culvert sediments at concentrations greater than New Jersey Impact to Groundwater Screening Criteria, and mercury is present in groundwater. Discuss how mercury sorbed to soils/sediments can leach to groundwater (solubility, mercury speciation, etc). This comment applies to all metals.

d. Last sentence: Revise the text to clarify what kind of methylation is being discussed in this sentence. If the sentence is specifically presenting the topic of mercury methylation, move this sentence to present it in discussion with mercury.

70. Section 6.2.1.2, first paragraph:

a. Second sentence: Revise the text to include discussion of VOC solubility values and their concentrations to illustrate this point.

b. Third sentence: This sentence does not follow from the one before it. There is no level provided in the previous sentence that could be referred to by "this level" at the beginning of this sentence. Additionally, the sentence indicates that a concentration of TCE is being referenced but the previous sentence provides PCE as an example. Clarify this text.

c. Fourth sentence: NAPLs can have a variety of constituents. However, this sentence seems to imply that only TCE is present in the NAPL at the site, which contradicts the second sentence in this paragraph. Clarify this text.

d. Fifth sentence: Dense non-aqueous phase liquid (DNAPL) is only mobile if the DNAPL overcomes the capillary pressure of the pore space. DNAPL can be present in the subsurface in mobile and immobile phases. Revise the text to include this discussion of DNAPLs and what characterizes each phase of DNAPL in the aquifer.

e. Remove the last two sentences of this paragraph as they both present transport rather than a discussion of chemical properties of the contaminants.

f. At the end of this paragraph, include a discussion of the NAPL persistence in the shallow aquifer above the meadow mat similar to the last sentence in the following paragraph.

71. Section 6.2.1.3: Naphthalene is a COC in shallow groundwater. Revise the text to include a discussion of naphthalene.

72. Section 6.2.1.3, first paragraph:

    a. First sentence: Organics are present in unsaturated soils and the concrete ditch and culvert sediments at the site, as well as in the aquifer. Include a discussion of organics in these additional media.

    b. Third and fourth sentence: Remove these sentences. These sentences, as indicated, should be reserved for evaluation in Section 7.

    c. Last sentence: PCBs are also discussed in this section. Revise this statement to include PCBs.

73. Section 6.2.1.3, CVOCs:

    a. Include discussion of other characteristics that affect environmental fate for CVOCs, such as solubility and volatility.

    b. First paragraph, first sentence: This citation is not in the reference section. Revise the citation or include it in the reference section.

    c. Second paragraph, top of page 60: This is an evaluation applying biodegradation principles as a remediation technology. Replace this paragraph with a discussion of how CVOCs can naturally degrade in the environment via naturally occurring reductive dechlorination, the type of environment in which natural reductive dechlorination would occur, and the process of reductive dichlorination. Also present the daughters products.

    d. Third paragraph: Revise the text to include a discussion of the abiotic degradation process as a whole and how it can relate to other CVOCs present at the site, as only an example for 1,1-DCE is provided.

    e. Third paragraph, second sentence: Remove this sentence as inclusion of this sentence does not follow discussion.

74. Section 6.2.1.3, Benzene:

    a. Revise the text to include discussion of the solubility and volatility of benzene. Indicate whether benzene is expected to be readily mobile in soils and leach to groundwater and/or expected to volatilize, and whether it is expected to behave differently in the presence of other solvents.

    b. First paragraph: Remove the first three sentences as this discussion, as indicated, should be reserved for evaluation in Section 7.

    c. Second paragraph: Provide discussion of the environmental conditions that would be conducive to biodegradation of benzene.

75. Section 6.2.1.3, PCBs:

    a. Remove the first two sentences as inclusion of these sentences does not follow discussion.

    b. Revise the text to discuss the behavior of PCBs in the presence of solvents (e.g., solubility of PCBs increases in the presence of solvents).

    c. Revise the text to include discussion of conditions that would influence desorption of PCBs.

    d. Revise text to include additional discussion characterizing the biodegradation of PCBs and the conditions under which biodegradation of PCBs occurs.

    e. Third sentence: Revise the sentence to refer to K_{oc} values. Additionally, reference the solubility of PCBs as an indicator for hydrophobicity.

76. Section 6.3:

    a. Revise the text to include discussion of all COCs in every media, providing rationale supported in chemical properties and fate to provide a basis for why the COCs are or are not in other site media.

    b. Present the expected dominant migration pathway for each COC or group of COCs discussed.

77. Section 6.3.1:

    a. Revise this section to include other transport pathways for COCs from the concrete ditch and culvert sediments, such as the potential for vaporization and migration as vapors.

    b. Fourth sentence: Move the parenthetical text to after “are not COCs in shallow groundwater.”

    c. Fourth sentence: The determination of COCs is based solely on the risk they present to receptors. The presence of the contaminant in groundwater serves as a basis in

determining whether a contaminant is migrating from the concrete ditch and culvert sediments into groundwater, not whether it causes unacceptable risk. If these COCs are present in shallow groundwater even at low concentrations, the concrete ditch and culvert sediments could serve as a source of continuing contamination. Revise the text accordingly. See General Comment No. G2.

d. Last sentence: Provide a basis for this statement. Include the discussion of the characteristics of mercury that can be used to evaluate whether mercury would leach into the groundwater. Discuss the solubility of mercury in the presence of solvents such as PCE and TCE. This supporting discussion and discussion of cobalt (not discussed at all in Section 6.2.1.1) should be included in a section discussing the chemical properties of these contaminants affecting their fate and transport. See general comments on Section 6.

78. Section 6.3.2, second paragraph:

a. Second sentence: Leaching of metals in the vadose zone by infiltration of water is not the only migration pathway for surface soils prior to surface paving. Revise the text to include discussion of contaminant transport via particulates in surface runoff.

b. Second sentence: Indicate which metals are more likely to desorb based on chemical properties discussed in the chemical properties section. See general comments on Section 6.

c. Fourth sentence: Revise the text to clarify if all site COCs are being discussed in this statement or if only the inorganic COCs are discussed in this sentence, which would be in line with the transport mechanism discussed in the second sentence in this paragraph.

d. Fifth sentence: Revise this sentence to properly describe vaporization and migration of COC vapors as follows: "…can evaporate and migrate through the soil pore space in vapor form." Revise the last sentence in this paragraph accordingly. Also discuss the conditions that would enhance vaporization (e.g., temperature).

79. Section 6.3.2, third paragraph:

a. First sentence: Revise the text to indicate which organic compounds are expected to be present in the form of NAPL.

b. Second sentence: Section 6.2.3 does not exist. Revise the text.

c. Last sentence: Revise the text to indicate where the contaminated rainwater and stormwater transport the COCs.

80. Section 6.3.2, fourth paragraph, second sentence:

a. Section 6.2.2 does not exist. Revise the text.

b. Revise the text to relate sorption of these materials to the concentrations of organic carbon measured in shallow soils.

81. Section 6.3.2, fourth paragraph, third sentence:

    a. If there is very little organic carbon in soils, sorption would not be a dominant pathway. Revise the text accordingly after performing an evaluation of the presence of organic carbon in the soils.

    b. Sorption is also influenced by soil moisture content. Include a discussion of how site-specific soil moisture content impacts contaminant migration.

    c. Leaching is also governed by a chemical's solubility. Discuss how migration is impacted by the solubility of each COC.

82. Section 6.3.3: Revise text to indicate which migration pathways are dominant for each COC present in shallow groundwater. Additionally, revise text to discuss groundwater flow, hydraulic conductivity, horizontal gradient, and vertical gradient.

83. Section 6.3.3, first paragraph:

    a. First sentence: Revise text to indicate the COCs that would be expected to be more mobile in shallow groundwater.

    b. Second sentence: Revise the text to include information that supports this statement. Migration of metals at the site also strongly depends on the speciation of the metal. Include discussion of metals speciation in a previous section. See general comments on Section 6.

    c. Last sentence: Revise the text to include discussion of what these retardation factors mean for migration at the site.

84. Section 6.3.3., second paragraph, second sentence: Revise "depends on" in this sentence to "is indicated by." Additionally, revise the text to include discussion of what these Henry's law constants mean.

85. Section 6.3.4:

    a. It is stated throughout the report that some COCs in deep groundwater can be attributed to regional degradation and contamination from impacted groundwater around OU-2 would migrate to the deep groundwater below OU-2 via groundwater flow. Yet it is stated in this paragraph that contamination present at MW-02D is never expected to migrate away from the well. This presents an issue with the overall groundwater mass balance at OU-2 (groundwater coming into the OU-2 groundwater system does not equal groundwater leaving). Revise the text to clarify how contamination from impacted deep groundwater upgradient of the OU-2 site can migrate into the deep groundwater below OU-2, but contamination in deep groundwater at OU-2 cannot migrate away from OU-2.

b. Revise the text to include discussion on how contamination at MW-02D can migrate throughout the deep groundwater (e.g., can it move through advection, diffusion) and how long contamination at this well would be anticipated to remain (e.g., would NAPL dissolution be slow or rapid).

c. Present the migration pathway that the CVOCs followed to migrate to deep groundwater during the well installation of MW-02D.

d. Revise the text to include a discussion of the potential for biodegradation of CVOCs in the deep groundwater aquifer.

86. Section 6.3.5:

a. First sentence: Revise the text to indicate which COCs are expected to be volatile.

b. Fourth sentence, top of page 63: Revise text to provide a discussion of what drives vapor migration (e.g., pressure differential, temperatures).

c. Fifth sentence: Include a citation for this statement.

Section 7

General Comments

87. Section 7 should be a culmination of information presented in all previous sections. Information should not be provided for the first time here. Revise he RI report text to include supporting information in sections prior to Section 7. Specific comments are provided below.

88. Section 7.1, titled "Sources": While the text is not clear, it seems to primarily discuss the primary sources and does not present more detail on the secondary sources. Revise this text to include a discussion of the secondary sources and explicitly indicate what those secondary sources are.

89. Section 7.2 is titled "Pathways," which indicates that the pathways of contamination would be discussed here; however, there is discussion in Section 7.1 of the pathways of contamination from those sources. This section could either be combined into one discussion with Section 7.1, since the discussion is redundant, or information regarding contaminant transport pathways should be removed from Section 7.1 and included solely in Section 7.2.

Specific Comments

Specific comments are provided on the current text; however, the text should be revised as indicated in the Section 7 general comments and overall general comments. Where text is reorganized, the comments apply to the new location of the text.

90. Section 7.1, first paragraph:

a. Revise the first bullet to state "Industrial wastewater and stormwater discharged from the OU-2 property and upgradient sources."

b. In the second bullet, specify what kind of "impacts" from historical operations are being referred to (e.g., spills of CVOCs, benzene, mercury). Remove "that predate Troy's ownership." Given there were mercury operations on the property through the 1980s, this conclusion cannot be drawn.

c. Revise this list to include the major source of groundwater contamination at OU-2 that has been reiterated throughout the report—upgradient groundwater contamination.

91. Section 7.1, second paragraph:

a. Third sentence: Revise to state "Historical operations at OU-2 resulted in…"

b. Last sentence: Historic fill did not result in COCs in shallow soil. The historic fill is the shallow soil at OU-2. Revise the last sentence to state: "Placement of historic fill throughout OU-2, which is expected to have been contaminated with lead, arsenic, and cadmium, resulted in soil contamination at the site. This soil contamination is expected to have leached to groundwater, resulting in groundwater contamination."

92. Section 7.1, third paragraph:

a. Second sentence: Revise the sentence to indicate the COCs present in the concrete ditch and culvert sediments that are likely contaminating shallow groundwater.

b. Third sentence: Revise the sentence to indicate that mercury and benzene throughout shallow soils also act as a source to groundwater contamination.

c. Third sentence: Revise the sentence or include an additional sentence indicating that mercury, benzene, and CVOCs in the concrete ditch and culvert sediments are also a potential source of soil vapor.

93. Table 7-1: This table mixes the concepts of historical and current sources of contamination with the concept of primary and secondary sources. Historic fill does serve as a current source of contamination to shallow groundwater because metals in the historic fill are still currently leaching into groundwater. However, historical site operations are no longer releasing contamination to any media. Therefore, they cannot serve as a current source of contamination to any media at the site. However, the releases from historical site operations did create a secondary source: shallow soils. These shallow soils, originally contaminated by historical site operations, are currently serving as a secondary source of contamination. Revise the designation of historical and current sources appropriately. Revise this column headers of this table as follows.

Media Impacted	Primary Sources of Contamination				Secondary Sources of Contamination		
	Upgradient Sources	Placement of Historic Fill	Releases from Historical Site Operations	Concrete Ditch and Culvert Sediments	Shallow Soils/ Historic Fill	Concrete Ditch and Culvert Sediments	Shallow Groundwater

94. Section 7.1.1: Table 7-1 indicates that upgradient sources are the reason for contamination in the deep groundwater. However, there is no discussion of deep groundwater supporting this assertion in Section 7.1.1. Revise the text to include discussion supporting the assertion that upgradient sources are a source of contamination to deep groundwater at OU-2.

95. Section 7.1.1, third paragraph:

    a. Third sentence: The conclusion that total PCB concentrations are typically below 1 mg/kg throughout OU-2 except in the sediments in the concrete ditch and culvert is not supported by the data. There are several total PCB concentrations greater than 1 mg/kg in shallow and deep soils (e.g., GS-B-102, GS-B-109, B-13, GS-B-101, B-15, GS-B103, GS-SS-101). The sentence should be revised to state "Soil samples show that total PCB concentrations are typically below 10 mg/kg throughout OU-2 except…"

    b. Sentences 4, 5, and 6: The detailed information about upgradient concentrations of PCBs at the ASD site is presented for the first time in the report. Since this information is used in Section 5 to make a number of statements related to upgradient contamination, include the detailed information in Section 5. See Section 5 General Comment No. 20. Revise Section 7 to only include a summary of this detailed information.

96. Section 7.1.1, fourth paragraph:

    a. The detailed information about soil and sediment contamination at an upgradient site is presented for the first time in the report. Since this information is used in Section 5 to make a number of statements related to upgradient contamination, include the detailed information in Section 5. Additionally, this RI Report is a standalone document; as such, provide pertinent information regarding the concentrations in media that served as a potential source of contamination to OU-2. See Section 5 General Comment No. 20. Revise Section 7 to only include a summary of this detailed information.

    b. Penultimate sentence: Provide a list of remedial actions on adjacent properties (and appropriate references) indicating the presence of COCs found at OU-2 on those properties in Section 2, if relevant to the development of the OU-2 CSM. If not relevant, remove this sentence from the report.

97. Section 7.1.1, fifth paragraph, first sentence: One of the lowest concentrations of benzene in shallow groundwater is detected along the boundary with the ASD site. Additionally, no discussion of benzene concentrations in shallow groundwater along this property line was provided in Section 5 that would support indicating the ASD site as a source of upgradient benzene contamination. Remove benzene from this sentence, unless Section 5 is revised to include discussion that would support including it here.

98. Section 7.1.2: The text is not clear about what "regional impacts" are or how they differ from "upgradient sources" as a source of contamination. Table 7-1 indicates that regional impacts were/are a source of contamination to the shallow and deep groundwater.

However, regional contamination would only impact OU-2 groundwater via contaminated groundwater transported from upgradient properties. Therefore, these sources should be categorized with "upgradient sources." This is supported by discussion in Section 5.3.1.1, which, for example, indicates that iron and manganese are "known to be in the shallow groundwater at the upgradient ASD site," making this "regional impact" an "upgradient source." Additionally, Section 9.1.3, second paragraph, second bullet, indicates that contamination at the upgradient ASD site is a "regional impact." Remove "regional impacts" as a source of contamination and combine this discussion with "upgradient sources."

99. Section 7.1.3, first paragraph:

    a. Second sentence: Section 2.7 does not exist. Revise the text.

    b. Fourth sentence of the paragraph to the end: The detailed information about contamination present in historic fill is presented for the first time in the report. Since this information is used in Section 5 to make a number of statements related to historic fill contamination, include the detailed information in Section 5. See Section 5 General Comment No. 20. Revise Section 7 to only include a summary of this detailed information.

100. Section 7.1.3, second paragraph, first sentence: There is no discussion in the report indicating the range of cadmium present in shallow soils at the site. Therefore, this statement is not supported in the report. Include discussion of cadmium in shallow soils in Section 5. See Section 5 General Comment No. 20.

101. Section 7.1.4:

    a. Revise the title of this section to match the table headers presented in Specific Comment No. 93, "Releases from Historical Site Operations."

    b. Revise this section to include a separate subsection for each item listed in the bullet list under the first paragraph. Include in each section a description of each of these operations (e.g., what kind of contamination would be in the direct discharges to the concrete ditch and culvert), which buildings/areas of the site they were performed in, and why they are sources (e.g., mercury spills from the former mercury recovery still) and brief summary of the contamination found in the areas related to each of these operations.

    c. Revise this section with potential additional sources based on Specific Comment No. 32c.

    d. Section 5.2.1.2 indicates that mercury contamination in the southwest corner of OU-2 could have been due to movement of soils when the parking lot was constructed. Include on-site earthwork as a source of contamination in this section.

102. Section 7.1.4, first paragraph, first sentence: Remove "that predate Troy ownership."

103. Section 7.1.4, third paragraph, first sentence:

a. This sentence notes that elevated mercury concentrations are present in soils near Building 20. Revise the text to include how mercury releases from site operations caused this mercury contamination in soil.

b. This section is a description of the sources, not a description of the transport pathways from the sources, which should be reserved for Section 7.2. Move the discussion of the vaporization pathway of mercury in shallow soils migrating via soil vapor and potentially impacting indoor air to Section 7.2.

104. Section 7.1.4, fourth paragraph, first sentence: Revise this sentence to indicate whether the mercury concentrations in groundwater greater than 100 µg/L were found while the former retort building was still operational. If not, revise the text to indicate what site conditions would have changed to cause the significant decrease in mercury concentrations in groundwater at MW-01 and MW-17.

105. Section 7.1.4, seventh paragraph: Move this text to an earlier section in the RI Report (potentially in the background information in Section 2) to provide context for the nature and extent of contamination discussion in Section 5.

106. Section 7.1.4, eighth paragraph:

a. First sentence: If this preferential pathway exists, it would also serve as a pathway for other contamination from the shallow groundwater to migrate to the deep groundwater, not just as a pathway for CVOC contamination. Revise the text to state "… it is possible that this pathway still exists and allows contamination in the shallow groundwater to migrate into the deep groundwater around MW-02D." Additionally, compare the contaminant concentrations found at MW-02D to the contaminant concentrations found in the shallow groundwater in this area to determine if this preferential pathway is causing other contamination to migrate. Discuss this evaluation in Section 5.3.

b. Fourth sentence: Move this discussion to Section 6 to support a determination if NAPL is present at MW-02D. If concentrations are greater than 1% of the contaminant's solubility, the concentrations are, conservatively, indicative of NAPL. Include the results of that evaluation in Section 7, similar to that as presented in Section 6 (e.g., it is likely that NAPL is present…).

107. Section 7.1.4, ninth paragraph:

a. First sentence: Revise the first sentence to state the following: "Therefore, it is possible that DNAPL is present at MW-02D. If a small amount of DNAPL is present, total CVOC concentrations in the groundwater at MW-02D will exhibit fluctuating concentrations due to the dissolution of NAPL."

b. Last sentence: See Specific Comment No. 85a.

108. Section 7.1.4, last paragraph: Benzene is present in surface and subsurface soils throughout the site, and concentrations of benzene do not decrease away from Building

56 for all samples. For example, GS-SS-104 and BR-17 contain elevated benzene concentrations. These two samples were collected along the eastern property boundary, far from the concrete ditch and culvert. Additionally, elevated concentrations of benzene in shallow groundwater were detected at MW-09 and TW-04, which are in the same area as elevated concentrations of benzene in shallow soils at BR-10 and TW-04P. This information indicates the potential for sources other than flooding from the concrete ditch and culvert or from upgradient groundwater. Revise the text accordingly.

109. Section 7.1.4, last paragraph, last sentence: See Specific Comment No. 97.

110. Section 7.1.5, first paragraph: This paragraph provides detail about flooding of OU-2 and the upgradient ASD site. However, since this is a discussion of the concrete ditch and culvert sediments as a source (Section 7.1, Sources), the discussion should be limited to a description of the source. Flooding is the transport mechanism that has caused contamination to migrate from this source. Revise the discussion to include more detail about the source—the concrete ditch and culvert, its construction, and the type of contamination present in the sediments. See Section 7 General Comment No. 88.

111. Section 7.1.5, second paragraph: There are concentrations of PCBs >1 mg/kg at depth throughout the site. This contamination is not expected to have been caused by flooding since rainwater infiltration would not be expected to cause PCBs to migrate vertically through soils. Revise the text to include discussion of these PCBs and evaluation of another source of this contamination. This evaluation should be supported by information on the expected fate of PCBs presented in Section 6. See comments on Section 6.1.2.3.

112. Section 7.1.5, third paragraph, first sentence: This conclusion cannot be drawn for the entire length of the concrete ditch and culvert based on two samples. See Specific Comment No. 28b. Additionally, GS-B-114 was actually collected below the concrete ditch and culvert and may indicate that contamination of the underlying soils is possible. Revise text accordingly.

113. Section 7.1.5, fourth paragraph:

    a. First sentence: Revise the sentence beginning at "… shallow groundwater through" to state: "… shallow groundwater through groundwater interaction with the concrete ditch and culvert sediments through the gabion-lined sections of the concrete ditch and culvert."

    b. Second sentence: Revise this sentence to state the following: "This contamination in groundwater could also serve as a source of contamination to the shallow soils as contaminants could partition onto the shallow soils." Additionally, this discussion presents the pathways of contamination. See Section 7 General Comment No. Comment 89.

    c. Second sentence: Include a sentence after this second sentence discussing which COCs would be likely to travel via the pathway outlined in the previous sentence based on a

discussion of the chemical properties and anticipated fate in Section 6. Include this discussion with the previous sentence. See Specific Comment No. 113b.

d. Last sentence: Because there is not a direct pathway for groundwater from the concrete ditch and culvert to flow only to the area around Building 56, benzene contamination in the concrete ditch and culvert are likely contributing to groundwater contamination throughout the site. Revise this statement to indicate such.

114. Section 7.2: This section only presents a discussion of COCs that may be migrating. Revise the text to also include a discussion of COCs that are expected not to migrate from the media they are in based on data presented in Section 5 and discussion in Section 6.

115. Section 7.2.1: Elemental mercury is present in the concrete ditch and culvert sediment. Revise the discussion to include potential migration pathways (or lack thereof) for elemental mercury.

116. Section 7.2.1, first paragraph:

a. First sentence: Revise "resulted" to "may have resulted."

b. Third sentence: Revise this sentence to state: "Additionally, stormwater at OU-2 is contained and pretreated on the OU-2 property; therefore, no water is discharged to the concrete ditch and culvert."

117. Section 7.2.1, second paragraph:

a. First sentence: Remove this sentence as the information is repeated in the third sentence of this paragraph.

b. Third sentence: Revise this statement to state the following: "Groundwater interactions with the sediments in the concrete ditch and culvert may introduce COCs (e.g., CVOCs, benzene, mercury) into the groundwater from the concrete ditch and culvert sediments through dissolution or colloidal transport." Additionally, there is minimal discussion of colloidal transport and the COCs that would be more likely to transport via colloids in Section 6. See Specific Comment No. 64b. Discussion in Section 6 should support the CSM.

118. Section 7.2.2, first paragraph, last sentence: Soils around Building 41 still contain elevated concentrations of COCs including lead, mercury, and PCBs. Additionally, an elevated concentration of mercury was found in MW-04, which is in the area of Building 41. Revise this statement to indicate there is contamination remaining in this area that may serve as a source of contamination to groundwater.

119. Section 7.2.2, second paragraph: While potential receptors are included in a CSM, the presentation of potential human receptors in this paragraph does not follow the structure of the report. Move this paragraph to the end of Section 7.2.2 as human receptors would be the final step in the overall migration pathway. Additionally,

discussion of the receptors is missing in Section 7.2.1; include a discussion here as well for consistency.

120. Section 7.2.2, third paragraph:

    a. First sentence: With groundwater rising to as much as 2 feet bgs, all COCs in soils might impact shallow groundwater regardless of whether a surface barrier is present to prevent rain water infiltration.

    b. Second sentence: Remove "However," at the beginning of the sentence.

    c. Second sentence: Benzene is present in shallow soils and groundwater throughout the site. Two examples are benzene contamination in soils and groundwater below Building 91 and east of Building 61. Remove "... in the area of Building #56" from the end of this sentence.

121. Section 7.2.2, fourth paragraph:

    a. First sentence: Section 6 states that arsenic, iron, and manganese are metals sorbed to soils that would be expected to leach from soils into groundwater. Include discussion of all metals in shallow soils in this section. Revise this text to be consistent with what is presented in Section 6. Additionally, see comments on Section 6.

    b. First and second sentences: The text is not clear. The first sentence indicates that mercury may be leaching but the second sentence indicates there is minimal leaching. The second sentence is based on the data. It is not clear what the first sentence is based on as discussion in Section 6 also indicates that mercury is remaining sorbed to soils, and there is no discussion of expected fate of cadmium in Section 6. Revise this text to be clear and consistent with what is presented in Section 6. Additionally, see comments on Section 6.

122. Section 7.2.2, third and fourth paragraphs: Many contaminants are present in shallow soils at concentrations greater than the New Jersey Impact to Groundwater Screening Levels, indicating that they could impact groundwater. Revise the text to include discussion of these contaminants.

123. Section 7.2.3, second paragraph:

    a. First sentence: Revise the text to indicate the receptor that's being discussed (e.g., human receptors) as being prevented from having direct contact with impacted groundwater. Also, revise this sentence to indicate that this type of direct contact is currently prevented but this could change in the future.

    b. Second sentence: This sentence, which is presenting a concept of contaminant transport from shallow soils to shallow groundwater, is irrelevant when discussing direct contact with impacted groundwater by human receptors. Remove this sentence.

124. Section 7.2.3, third paragraph: Discussion on the implementability and effectiveness of remedial alternatives for shallow groundwater should be reserved for the feasibility study. Remove this paragraph.

125. Section 7.2.3, fourth paragraph:

    a. Second sentence: The assertion that downgradient properties likely had CVOCs and benzene in their groundwater due to regional contamination is speculation, unless data are included in the report to support this. Additionally, any regional contamination would be coming from the upgradient site, which in this case, would be OU-2. Remove this portion of the sentence.

    b. Second sentence: The transport pathway causing CVOC and benzene contamination on downgradient properties from discharges from upgradient properties to the concrete ditch and culvert is not clear. Downgradient properties are the subject here; therefore, any properties upgradient of the downgradient properties would include OU-2. Revise the discussion to clarify and detail this transport pathway. However, if this is indicating that discharges from the concrete ditch and culvert impacted downstream sediments on downgradient properties, which then impacted shallow groundwater on downgradient properties, include this as a source of contamination in Section 7.1 and clarify the text.

    c. Third sentence: Remove this sentence as it was previously stated at the beginning of this paragraph.

    d. Fourth sentence: There are elevated concentrations of benzene in the concrete ditch and culvert; MW-16 and MW-17 are located immediately adjacent to the concrete ditch and culvert. Therefore, a likely source of benzene contamination at these two well locations is the concrete ditch and culvert. While there may be an upgradient source of benzene contamination to the shallow groundwater, using benzene concentrations in MW-17 and MW-16 to illustrate this point is not well supported. Revise the text accordingly.

126. Section 7.2.3, last paragraph, fourth sentence: Revise this sentence to state: "The lower permeability meadow mat under the historic fill could limit some migration of contaminants downward into the deep aquifer; however, the lower permeability till of the deep aquifer likely limits migration more effectively than the meadow mat." Remove "finally" at the beginning of the sentence that follows.

127. Section 7.2.4, first paragraph:

    a. First sentence: Indicate the start and end points of this vertical migration (e.g., vertical migration of COCs from shallow groundwater to deep groundwater).

    b. First sentence: Revise this statement to reflect the removal of "regional degradation" as a source of contamination. See Specific Comment No. 98.

c. Second sentence: Revise the sentence to state the following: "Additionally, monitoring data indicate little evidence of vertical migration of COCs between the two aquifers."

128. Section 7.2.4, second paragraph:

a. First and second sentence: Revise the text to clarify the distinction between PCE and TCE due to regional degradation stated in the first sentence, and the PCE and TCE in the second sentence (e.g., how does the data allow for distinguishing between two separate sources of this contamination?).

b. Third sentence: Remove this sentence as it does not follow the discussion in this paragraph.

c. Last sentence: Even with low groundwater velocities, contamination in the deep groundwater will migrate downgradient over time. See Specific Comment No. 85a. Revise the text accordingly.

129. Section 7.2.5.1, third paragraph, last sentence. Revise the sentence to "Therefore, the source of chloroform detected in the indoor air of these four buildings may be related to the chlorinated water used in the heating systems."

130. Section 7.2.5.1, seventh paragraph. Change the text to "Therefore, there is no identified source of ethylbenzene that could pose a concern to indoor air in Buildings 20 and 98 under current conditions."

131. Section 7.2.5.1, eighth paragraph. Identify what is meant by background sources.

Section 8

132. Revise the summary of risk assessments in Section 8 to reflect, and be consistent with, the general and specific comments provided on the BHHRA. Specific comments on Section 8 will also be included in the BHHRA comments that will be submitted separately.

Section 9

General Comments

133. Revise the summary and conclusions to reflect, and be consistent with, the general and specific comments provided herein.

Figures and Tables

General Comments

134. Revise figures and tables in accordance with the specific comments.

135. Section 5 Figures: Modify the presentation of the "bins" to identify which standards were used. Either include the relevant standard in the legend (i.e., "<300 (NJDEP Class IIA GWQS) or include the concentration in the footnote regarding standards (i.e., "Concentration bins are related to NJDEP Class IIA GWQS [300 µg/L]).

Specific Comments

136. Table 5-1a: Samples B-11 and B-12 are shown on Figures 5-1 and 5-2 as being ditch material samples. However, these samples are not shown on other concrete ditch and culvert figures. The data is not provided on Table 5-1.

137. Table 5-1a: The Section 5.1.1.1 text states that concentrations of lead are above 10,000 mg/kg in thirteen samples from the concrete ditch and culvert material. According to Table 5-1a, there are nineteen samples that have concentrations of lead above 10,000 mg/kg (PC-2T-6.0, PC-2-W-4.0, PC-3-E-2.5, PC-3-T(8.0), PC-4-E.1.5, PC-4-E.2.0, PC-4-T(7.0), PC-4-W.1.5, PC-4-W.2.0, PC-5-E.2.5, PC-5-W.1.5, PC-5-W.2.0, PIT-02A, PIT-03, PIT-04, PIT-05, PIT-06, TP-14(10.0), TP-19(7.5)).

138. Table 5-1a: The Section 5.1.1.2 text states that concentrations of mercury are above 1,000 mg/kg in seventeen samples from the concrete ditch and culvert material. According to Table 5-1a, there are eighteen samples that have concentrations of mercury above 1,000 mg/kg (the field duplicate was not included in this count).

139. Table 5-2a: The Section 5.1.1.4 text states that concentrations of PCE are above 1,500 mg/kg in fourteen samples from the concrete ditch and culvert material. According to Table 5-2a, there are fifteen samples that have concentrations of PCE above 1,500 mg/kg (the field duplicate was not included in this count).

140. Table 5-1a: The Section 5.1.2.1 text states that the maximum concentration of cobalt was 1,800 mg/kg detected at PIT-04; otherwise, cobalt concentrations were below 590 mg/kg. According to Table 5-1a, the sentence should state “otherwise, cobalt concentrations were below 510 mg/kg.”.

141. Table 5-2a: The Section 5.2.1.1 text states that six locations had concentrations above 10,000 mg/kg. This does not include the concentration greater than 10,000 mg/kg at BR-20.

142. Table 5-2a: The results for GS-B-114 for the sample collected from 13.25 to 14.25 feet bgs are missing from this table. Revise the table to include this data.

143. Figure 5-1: Sample results for PIT-01B, PIT-02A, PIT-02B, PIT-03, PIT-04, PIT-05, and PIT-06 are not shown on Figure 5-1, but the data is presented in Table 5-1a.

144. Figure 5-2: This figure presents data for samples B-11 and B-12 that are not presented as below the concrete ditch and culvert in Section 5.1.3 and are included in Table 5-2a-c as soil samples. If these locations are indeed soil samples, remove these locations from Figure 5-2 and include them on Figures 5-8 through 5-28. Figure 5-11 through 5-19, 5-21, 5-22, 5-24, 5-25, 5-27 through 5-31 incorrectly label Building 37 as Building 35. Check all figures and revise them accordingly.

145. Figure 5-4: The label for PC-3-W is pointing to the green triangle, but it should be pointing to the orange triangle. Review figures to make sure all labels are pointing to the correct icons.

146. Figure 5-8: Boring BR-20 is shown to have all concentration of lead below 10,000 mg/kg. Table 5-2a indicates that the concentration of lead at BR-20 was 19,500 mg/kg from 1.5 to 2 feet bgs.

147. Figure 5-9: Boring B-20 is shown to have all concentrations of mercury below 350 mg/kg. Table 5-2a indicates that the concentration of mercury at BR-20 was 2,350 mg/kg from 1.5 to 2 feet bgs.

148. Figure 5-10: BR-20 should be colored red as the concentration of lead was 19,500 mg/kg at BR-20 from 1.5 to 2 feet bgs.

149. Figure 5-13: Boring BR-20 should be colored red as the concentration of mercury was 2,350 mg/kg at BR-20from 1.5 to 2 feet bgs.

150. Figures 5-8, 5-11, 5-14, 5-17, 5-10, 5-23, 5-26, and 5-29: Show the outline of the Building 41 excavation.

151. Figures 5-8 through 5-31, post-excavation samples collected in the area of former Building 41: Revise the soil graphs and other soil figures to be reflective of the elevation at which the post-excavation samples were collected (e.g., a bottom excavation sample should not be presented in the graph as if it is at the surface).

152. Figure 5-42: The third and fourth pages of the graphs are titled “Manganese Trends” but they show benzene concentrations. Resolve this inconsistency.

Appendices

Specific Comment

153. Appendix A: Provide flysheets and bookmarks to indicate which references are provided in this appendix. Since a majority of these references are letters, it is difficult for the reader to determine exactly what references are provided.